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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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09/458,123

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BLAINE R. SPADY

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12/23/2004

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EXAMINER

STOCK JR, GORDON J

ART UNIT

PAPER NUMBER

2877

DATE MAILED: 12/23/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

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Office Action Summary

Application No.

09/458,123

Applicant(s)

SPADY ET AL.

Examiner

Gordon J Stock

Art Unit

2877

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 08 October 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-9 and 15-24 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 15-24 is/are allowed.
- 6) ☒ Claim(s) 1, 2, 6, 7 and 9 is/are rejected.
- 7) ☒ Claim(s) 3-5 and 8 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 08 October 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. **Claims 1, 7, and 9** are rejected under 35 U.S.C. 102(b) as being anticipated by **Cheng (5,546,179)**—previously cited.

As for **claim 1**, Cheng discloses the following: positioning a wafer (Fig. 1: 22) to a fixed station (Fig. 1: 10 fixed by 20 and 38); aligning an optical system to the wafer—wherein the optical system moves (Fig. 1: white arrows showing vertical and horizontal movement of the optical system); to follow the edge to locate an alignment feature, an index mark (Fig. 2: steps 66 and 68); moving the optical system relative to the wafer to inspect a plurality of inspection areas on the wafer (Fig. 2: 70, 71).

As for **claim 7**, Cheng discloses everything as above (see **claim 1**). In addition, Cheng discloses measuring reflectance of the wafer and locating an edge from a drop in reflectance (Fig. 2: 70; col. 8, lines 60-65; col. 11, lines 1-10).

As for **claim 9**, Cheng discloses everything as above (see **claim 1**). In addition, Cheng discloses measuring film thicknesses on the wafer (col. 7, lines 58-62).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. **Claim 2** is rejected under 35 U.S.C. 103(a) as being unpatentable over **Cheng (5,546,179)**—previously cited in view of **Elliott et al. (5,669,979)**.

5. As for **claim 2**, Cheng discloses everything as above (see **claim 1**). In addition, he teaches the fixed station is inside a processing apparatus (col. 7, lines 55-65). He is silent concerning viewing the wafer from outside of the processing apparatus through an optical window in the processing apparatus. However, Elliott in a processing apparatus teaches having a window for remote sensing of the wafer by an optical system (Fig. 15: 430). Therefore, it would be obvious to one of ordinary skill in the art at the time the invention was made to have a window to have the optical system view remotely in order to protect the optical system from the processing environment.

6. **Claim 6** is rejected under 35 U.S.C. 103(a) as being unpatentable over **Cheng (5,546,179)**—previously cited in view of **Hampton (4,794,238)**.

As for **claim 6**, Cheng discloses everything as above (see **claim 1**). In addition, he discloses a rotating a portion of the stage about a rotation axis (Fig. 1: rotating via 34) to move the support linearly to cross a center of a first of the inspection areas thereby having a linear axis cross and thus moving a portion of the stage along the linear axis of the support (Fig. 1: 26 and 28 move laterally across wafer evidenced by white arrow for x directional movement). As for moving the support arm until a distance from the emitter/receiver to the wafer is equal to the distance from the rotational axis to the wafer, he does not explicitly state this. However, the height distances between 40 and 22 appear to be equal to the height distance between 34 and 22

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(Fig. 1). And he discloses that measurements are performed at a plurality of x and z positions for profiling the wafer (Figs. 4b, 5b). Therefore, it would be obvious to one of ordinary skill in the art at the time the invention was made that a distance between the optical system and the wafer that is along a linear axis, the x-axis of the support arm, will equal the distance between the rotational axis as described by the turning of 34 (in Fig. 1) and the wafer, for the support arm goes through a plurality of z positions.

As for the objective lens, he is silent. However, Cheng discloses the optical system is a bar code reader (Figs. 8 and 8a). Hampton in a bar code reader discloses the bar code reader comprising an objective lens (Fig. 1: 25). Therefore, it would be obvious to one of ordinary skill in the art at the time the invention was made that the bar code reading optical system comprised an objective lens in order to direct light to the wafer and to direct light to the photodetector.

Allowable Subject Matter

7. **Claims 15-24** are allowed.

Claims 3-5 and 8 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

As to **claim 3**, the prior art of record, taken alone or in combination, fails to disclose or render obvious in a method for inspecting a wafer imaging each of the inspection areas using the optical system; and rotating images formed by the optical system, in combination with the rest of the limitations of **claims 3-5**.

As to **claim 8**, the prior art of record, taken alone or in combination, fails to disclose or render obvious in a method for inspecting a wafer further comprising processing an image of an

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area of the wafer using an image recognition module, in combination with the rest of the limitations of **claim 8**.

As to **claim 15**, the prior art of record, taken alone or in combination, fails to disclose or render obvious in a method for inspecting a wafer holding the wafer in a stationary position while moving an optical system rotationally relative to the wafer and locating an alignment feature on the edge of the wafer, in combination with the rest of the limitations of **claims 15-20**.

As to **claim 21**, the prior art of record, taken alone or in combination, fails to disclose or render obvious in a method for inspecting a wafer with an optical system providing lateral movement of the optical system with respect to the wafer and providing relative rotational movement between the optical system and the wafer and imaging at least one inspection area on the wafer using the optical system and rotating the image of an inspection area based on the relative angular orientation of the optical system with the wafer, in combination with the rest of the limitations of **claims 21-24**.

Response to Arguments

8. Applicant's arguments with respect to the claims 1-9 in Remarks of October 8, 2004 have been considered but are moot in view of the new ground(s) of rejection. In addition, applicant's arguments in regards to claims 15-24 have been found persuasive. Subsequently, the rejections to the claims from the last action have been withdrawn. Examiner apologizes for the inconvenience due to the rejection under 35 U.S.C. 102(b) and 103(a) with Cheng (5,546,179) previously cited but upon further consideration of the reference and the term "fixed station" the new rejections were made.

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9. The declaration filed on October 8, 2004 under 37 CFR 1.131 is sufficient to overcome the **Sullivan et al. (6,414,752)** reference. Subsequently, the rejections under 35 U.S.C. 103(a) in view of Sullivan in the last action have been withdrawn. However, new rejections for claims 1, 2, 6, 7, and 9 have been made. See above.

Conclusion

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure: U.S. Patent 5,238,354 to Volovich (specifically, fixed station 11 of Fig. 1).

Fax/Telephone Numbers

If the applicant wishes to send a fax dealing with either a proposed amendment or a discussion with a phone interview, then the fax should:

1) Contain either a statement "DRAFT" or "PROPOSED AMENDMENT" on the fax cover sheet; and

2) Should be unsigned by the attorney or agent.

This will ensure that it will not be entered into the case and will be forwarded to the examiner as quickly as possible.

Papers related to the application may be submitted to Group 2800 by Fax transmission. Papers should be faxed to Group 2800 via the PTO Fax machine located in Crystal Plaza 4. The form of such papers must conform to the notice published in the Official Gazette, 1096 OG 30 (November 15, 1989). The CP4 Fax Machine number is: (703) 872-9306

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gordon J. Stock whose telephone number is (571) 272-2431.

The examiner can normally be reached on Monday-Friday, 10:00 a.m. - 6:30 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory J. Toatley, Jr., can be reached at 571-272-2800 ext 77.


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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private Pair system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



gs

December 17, 2004


Zandra V. Smith
Primary Examiner
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